

Permutation: An arrangement in a particular order. **Symbol: nPr**

2. How many ways can 5 paintings be lined up on a wall?



Formula: $n!$

Factorials $n! = n \times (n-1) \times (n-2) \times \dots \times 2 \times 1$

Permutations of Groups that are not whole:

n objects taken r at a time

Formula:
$$\frac{n!}{(n-r)!}$$

Example: How many 5-letter passwords can be made if you CANNOT repeat letters?

Permutations of Groups with Repetition:

Formula: $\frac{n!}{r_1!r_2!r_3!\dots}$

Example: How many words can be made using the letters in PENCIL?

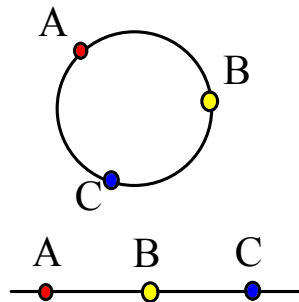
P N I
E C L

How many words can be made using the letters in MISSISSIPPI?

S S S
M S S
I I I P
P

Warm Up 3.23.2011 Circular Permutations

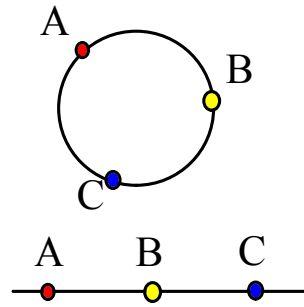
How many ways can you use the circle to make a linear arrangement? The first one is done for you.



Warm Up 3.23.2011
Circular Permutations

Formula: $(n - 1)!$

Keyword: circular



Example: How many ways can
8 snacks be put on a circular
tray?

**Combination: An arrangement of objects where
order does not matter.**

Symbol: nCr

Formula:
$$\frac{n!}{r! (n - r)!}$$

n-total objects

r-number being chosen

How many ways can you choose a committee
of three people from a group of 5?

How many ways can you choose a president,
vice president and treasurer from a group
of 5 people?

Combinations with Multiple Events

Formula:
$$\frac{n!}{r! (n - r)!}$$

n-total objects

r-number being chosen

Your sock drawer has 3 black socks, 4 blue socks, and 10 white socks. How many ways can you pull out a combination of 2 black socks and 2 white socks?



How many combinations of 2 **black socks** can be made?

How many combinations of 2 **white socks** can be made?

Try #17-19

Combinations and Probability

$$P = \frac{\text{number of "good outcomes"}}{\text{total number of outcomes for that sample}}$$

Your sock drawer has 3 black socks, 4 blue socks, and 10 white socks. What is the probability you pull out a combination of 2 black socks and 2 white socks?

How many combinations of 2 **black socks** can be made?

How many combinations of 2 **white socks** can be made?

How many **total** ways can you pull four socks from the drawer?

Try #20-22



Attachments

Tri 3 Expectations.ppt